

# Forest Insect & Disease Conditions in the Northeast—1956

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## PREFACE

This annual report on forest pest conditions in the Northeast combines, for the first time, information about both the major forest insects and the major forest diseases in the region. It was prepared as an aid to those who have a concern for protecting our forests from insect and disease attacks.

The information in this report was compiled from many sources, and we thank the many individuals and agencies who contributed to it. Timely interchange of information is essential to the forest pest survey and control program in the Northeast. To speed this interchange of information, the Northeastern Forest Experiment Station initiated in 1956 a new report series, the NORTHEASTERN FOREST PEST REPORTER, a leaflet that is published monthly during the forest pest field season. The reports submitted for the NORTHEASTERN FOREST PEST REPORTER were helpful in the preparation of this annual report.

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# Forest Insect & Disease Conditions in the Northeast—1956

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## THE GENERAL SITUATION

PROTECTING our northeastern forests against destructive pests presents a great challenge today.

There is, first, the problem of reducing the volume loss and improving the quality of existing natural stands, young and old. The losses sustained in merchantable stands because of insects and disease far outweigh the losses due to all other destructive agencies. They are, however, mostly of the indirect kind--in growth loss rather than outright tree mortality. The effects on timber quality also are not so spectacular: they are so common as to be accepted generally as a regular feature of timber-growing in this region.

Second, the renewed stimulus to large-scale tree planting offered by the Conservation Reserve phase of the Soil Bank program brings public and private landowners alike face to face with the problem of avoiding the now obvious mistakes of the last extensive planting boom of CCC days. Or, if as appears more likely, the hazards of selecting and planting single species in large blocks cannot be avoided, then protection must be accepted as a vital phase of the overall planting program. Only by increased effort along these lines can the expected returns be assured.

Of the thirteen insect species or groups of major importance reported in 1956, seven were damaging to plantations. The pine sawflies continued as a serious problem in many areas. In New York and New Jersey, for example, spraying has become an annual chore. The increased thinning and pruning in pine stands at or approaching merchantable size has resulted in increased attack by Ips beetles, particularly in Connecticut, Massachusetts, southern New Hampshire, and New York. Strictly secondary pests such as the turpentine beetles, the root collar weevil, the deodar weevil, and Pissodes approximatus are known to be very prevalent, although not reported specifically. The white-pine weevil, the European pine shoot moth, and the Nantucket pine tip moth continued their insidious work at a high rate in 1956. The Matsucoccus scale appeared as a greater threat to planted red pine in the Northeast, as the main body of infestation in southern Connecticut increased to 150 square miles and some exotic pine species proved to be suitable new hosts.

In natural coniferous stands, the spruce budworm, the balsam woolly aphid, and the pine leaf aphid were of major importance in 1956. The spruce budworm infestation in northern Maine spread to include more than 3,000,000 acres; and the number of insects increased in many areas. Less evident but nonetheless real damage by the balsam woolly aphid continued in Maine, New Hampshire, Vermont, and New York. The pine leaf aphid was very abundant on white pine in these same states, with some mortality of young trees reported in Maine, Vermont, and New York.

Hardwood defoliators were much in evidence in 1956. Two outstanding changes took place, however--the extensive outbreak of the forest tent caterpillar in the past several years in the northerly states declined to a level where defoliation was negligible; and the variable oak leaf caterpillar rose to epidemic proportions in southern New Jersey, Delaware, and Maryland. Two old acquaintances, the fall cankerworm and the saddled prominent, were serious in localized areas. The gypsy moth was at a low ebb throughout most of the generally-infested portion of New England. Extensive spraying operations, covering 941,464 acres, were conducted in these states and in the regulated area in eastern New York, northeastern Pennsylvania, and northern New Jersey.

Only a few diseases were reported as outstanding in 1956. Oak wilt was found in new localities in Pennsylvania, Maryland, and West Virginia. In New Jersey a late spring freeze and an insect defoliator caused such excessive defoliation that adequate surveys for oak wilt were not possible. However, New Jersey, New York, and New England apparently continue to be free from the disease. Most of the region

that is affected by oak wilt is also concerned with an oak dieback, the cause of which is unknown. New York, Pennsylvania, and West Virginia reported red, scarlet, and black oaks with extensive dieback and some mortality. No pathogenic fungus has been obtained in isolations. The drought of 1953 may have been a contributing factor, at least in some areas. In general, the trouble does not seem to have increased significantly in 1956.

Sweetgum blight in Maryland, Delaware, and southward (also of unknown origin) continues, but with slightly less intensity than in previous years. On conifers, particularly in plantations of white and red pine, Fomes annosus heart-rot is becoming increasingly important. As the trees become older and thinning operations become necessary, a high incidence of butt- and root-rot may occur. The infection of stumps left in thinning, or of basal wounds, or of broken roots, produces a build-up of inoculum for further infection. The creosoting of stumps, which has proved an effective means of control in Great Britain, is being tried out by investigators in the Northeast.

In plantations of white pine and Norway spruce, pruning of branches 3 to 5 inches in diameter, or larger, has resulted in infection by Stereum sanguinolentum, which causes heartrot. Blaze wounds also may become infected. The prevention of all types of wounds during thinning or logging operations is important in controlling heartrots of both conifers and hardwoods. In plantations of conifers grown for Christmas trees, needle-cast fungi are of considerable importance. Rhabdocline pseudotsugae and Adelopus gäumannii attack young Douglas-fir, causing a yellowing of the needles and partial or complete loss of 2-year-old needles. White and Scotch pines attacked by Lophodermium pinastri also may lose their needles during the year following infection. These fungi are widespread in the Northeast and seem to be more troublesome on trees on poor sites or outside their natural range.

## MAJOR FOREST INSECT PESTS

### Spruce Budworm

Budworm populations in northern Maine increased considerably in both numbers and extent in 1956. Noticeable defoliation, mapped by aerial survey, covered more than 3,000,000 acres in the eastern and northeastern part of the state. Traces of budworm feeding were also noted by ground

observers west and southwest of the generally infested area. This increase in extent and severity of infestation, approximately a 10-fold increase in area and a comparable rise in population levels in most sectors, had been anticipated by the findings of the 1955 egg-mass survey.

The distribution and abundance of the budworm in 1956 was roughly comparable to that in 1949 and 1950. However, whereas the overall infestation showed a progressive decline for 5 years after 1950, the 1956 egg-mass survey has indicated a potential increase in population levels in 1957. Fortunately, no significant spread of the infestation is indicated, and the expected increase in numbers is not great. As in 1956, light to medium populations will again characterize the overall infestation, with heavy feeding appearing only in the Armstrong Brook and Little Madawaska River drainages in T17R3, Stockholm, T16R4, Westmanland, and Perham, and possibly in scattered fir stands throughout the northeastern townships adjoining New Brunswick. The extensive budworm outbreak in New Brunswick and Quebec persisted in 1956, and large-scale spraying operations are planned again for 1957.

Budworm populations in the fir forests of New Hampshire, Vermont, and New York remained at an endemic level. Very light defoliation was reported from northern New Hampshire.

#### Pine Sawflies

This aggressive group is very destructive to natural stands as well as to plantations. Most sawflies find optimum conditions for development and survival on a certain host or a fairly restricted number of hosts. Therefore they are strongly favored by the abundance of suitable food material presented by pure stands, planted or natural. As planting programs are intensified, satisfactory control of these pests must be assured. Recently developed chemical- and biological-control methods--the latter involving dispersal of virus polyhedral suspensions--have proven effective and economical in most instances. Certain sawflies continued their depredations in 1956. The more important of these are listed below.

European pine sawfly (*Neodiprion sertifer*).--Caused severe defoliation of planted red pines throughout southern Connecticut, southeastern New York, and northern New Jersey. Control measures were applied in localized infested areas. A heavy infestation covering 200 acres around the Stamford,

Conn., reservoir was sprayed with a virus polyhedral suspension by helicopter at the rate of 2 gallons per acre. Subsequent examinations revealed few survivors. Further investigation will be made in this area in 1957 to determine the carry-over effect of the treatment.

Red-headed pine sawfly (Neodiprion lecontei).--Very active in plantations in nearly all states in the region. Defoliation was most prevalent and severe on red and Scotch pine.

Red-pine sawfly (Neodiprion nanulus).--Found infesting red pine plantations in St. Lawrence County, N. Y., since 1945. A marked increase occurred in 1954, with a continued build-up in 1955. This year approximately 1,200 acres were sprayed by airplane with a 12-percent oil solution of DDT at the rate of 1 gallon per acre. Good control was reported in most of the treated plantations. A sequential sampling plan has been developed to facilitate egg surveys for this insect in suspect plantations. This method provides a rapid, yet reliable, means of determining which areas may need control measures the following season. Surveys conducted this winter (1956-57) indicate no areas requiring treatment in 1957.

Neodiprion pratti pratti.--Recently described and given a technical name, but as yet without a common name. The current outbreak on Virginia pine in Maryland extended its limits slightly in 1956. As mapped by aerial survey, heavy defoliation was confined largely to the Patuxent River drainage between Laurel and Ridgeville. Lighter defoliation occurred in surrounding areas. The noticeable defoliation covered over 2,000 acres.

Extensive defoliation of pitch pine in southeastern Burlington County and west-central Ocean County, New Jersey, was caused by a sawfly, identified at first as Neodiprion dyari. This wide-ranging, variable species has been found to be synonymous with N. pratti and separated into three subspecies according to geographic distribution and host (note N. pratti pratti above). The sawfly now infesting pitch pine in southern New Jersey has been common there for 25 years or more and similar attacks on pitch pine have been reported periodically from Connecticut, Massachusetts, and New York. The species involved is probably N. pratti paradoxus as now named.

Neodiprion taedae taedae.--Continued attacks on loblolly pine in localized areas in southern Maryland and the Eastern Shore. The peak in numbers and extent of infestation by this insect occurred in 1954. Since then, populations

have declined, although noticeable defoliation was reported from several localities in 1956. This sawfly has undergone a recent name change also--it was long recognized as N. americanum.

#### White Pine Weevil

The characteristic damage by this pest is so prevalent year after year that many landowners--and even practicing foresters--have come to accept it as a natural hazard to white pine growth. The direct and indirect losses in both volume and quality of white pine caused by this insect are staggering. This is best evidenced, perhaps, by the fact that white pine has been practically abandoned for planting in those states where the weevil is prevalent. This state of resignation is further exemplified by the oft-expressed wistful hope of getting "just one clear butt log" from a tree. Most cultural and chemical control practices now recommended have this objective in mind. It seems doubtful whether white pine in the Northeast can ever compete in the national lumber market and contribute its full potential to the forest economy of the region on a long-term basis with such a limited objective. In 1956, the depredations of the weevil continued at a high level throughout the region.

#### Shoot and Tip Moths

The European pine shoot moth and the Nantucket pine tip moth are also major deterrents to planting programs. The shoot moth has caused immeasurable damage to red pine in the Northeast, particularly to Christmas tree and reforestation plantings in Connecticut, New York, New Jersey, Delaware, and Pennsylvania. The planting of red pine in Connecticut and New Jersey has virtually ceased in recent years; in New York and Pennsylvania continued planting of this species is viewed with considerably less enthusiasm than when first initiated. Scotch pine is attacked to a lesser extent. A reconnaissance survey in West Virginia in 1956 revealed scattered infestations throughout the northern part of the state. The southernmost distribution of this pest is defined at present by the southern limits of planted red pine, which includes the northern sections of Maryland and Delaware.

The tip moth has seriously affected loblolly pine plantings in Delaware and Maryland. It is of less consequence on pitch pine and other species northward. It occurs more sporadically than the shoot moth and is apparently in-

fluenced strongly by stand composition. Populations and resultant damage are much less severe in natural stands of mixed loblolly-Virginia pine than in loblolly pine plantations in Delaware. Damage is relatively light in many mixed plantings in Maryland, while pure plantations of loblolly pine generally show evidence of heavy feeding, past or present.

Populations of both insects maintained a high level in 1956, and serious injury to host trees was reported from many sections.

#### Pine Engraver Beetles

Although 1956 was a generally unfavorable year for these beetles (*Ips* sp.), severe local outbreaks occurred in southern New Hampshire, central Massachusetts, northern Connecticut, and New York. For example, an aerial survey of red pine plantations around the Quabbin Reservoir in Massachusetts revealed 15 large groups of *Ips*-killed or infested trees. Much of the red pine in this region--some planted by the CCC, and some planted in the early 1940's by the states and private landowners--is now of merchantable size. Thinnings, prunings, and outright cuttings are being carried out on an increasingly large scale. Many of the infestations reported in 1955 and 1956 were associated with such operations. In certain areas of New York, the practice of girdling undesirable red pines and leaving them in the stand has induced beetle attack and has resulted in damage or mortality to surrounding trees. Proper timing of operations and careful cutting, thinning, and slash disposal are necessary to avoid considerable loss to these pests.

#### Balsam Woolly Aphid

This perennial enemy of balsam fir has killed a considerable volume of trees in northern New England and New York. An estimated 10 to 20 percent of the merchantable-sized fir has been killed in eastern and central Maine. In the coastal area, the gout type of injury to young trees is most common. The insect is now in epidemic numbers in the Green Mountain and White Mountain National Forests in Vermont and New Hampshire, respectively. A limited survey of infested stands in these National Forests in 1956 indicated an overall loss of 14.5 percent in the volume of fir in the past 5 years. This did not include growth loss. The estimated total volume killed or presently infested in attacked

stands ranged from 4 to 72 percent. Sanitation-salvage operations are now planned to utilize some of this timber and to minimize future losses.

#### Pine Leaf Aphid

This interesting insect, which attacks white pine and red or black spruce in alternate years, was very abundant in 1956 in New York, Vermont, New Hampshire, and Maine on white pine. Very severe flagging of pine tips was reported from a wide area in eastern Maine, and noticeable injury occurred throughout the central part of the state. An intensive survey of affected stands in Somerset, Piscataquis, Washington, and Hancock Counties by Maine Forest Service personnel showed that severe damage was generally limited to intermediate and suppressed trees in mixed stands. Tree mortality of 10 percent was recorded for these smaller trees in the stands examined in Washington and Hancock Counties, while only tip damage was noted on the larger trees in mixed stands and on trees of all classes in pure pine stands. Open stands apparently favored aphid populations, as the tip kill in these stands was generally much greater than in closed stands. However, this was offset by considerable adventitious shoot growth on the open-grown trees.

Some mortality of young pines occurred in New York and Vermont, where infestations have been present for several years. The terminal galls on spruce, which are caused by this insect, will be much in evidence in 1957.

#### Red Pine Scale

The main infestation of this Matsucoccus scale in Connecticut now covers approximately 150 square miles, as compared with 90 square miles in 1955. The greatest spread was 2 to 3 miles north and eastward. Scattered spot infestations occur beyond these limits in southwestern Connecticut, and the small infestations in Westchester County and Long Island, New York, are still present also. This insidious pest successfully maintained itself on two exotic pines, Japanese red pine (Pinus densiflora) and a Chinese pine (Pinus tabulaeformis), at the Boyce Thompson Institute at Yonkers, New York, through 1955 and 1956. These, and possibly other pines, must now be considered potential hosts for the scale in the Northeast.

Forest Tent  
Caterpillar

The extensive outbreak of the past several years in New York and New England has fully subsided. Little defoliation by this periodically destructive pest was reported in 1956.

Gypsy<sup>1</sup>  
Moth

During the 1956 control season 941,464 acres of woodland and open terrain were sprayed for eradication or suppression of the gypsy moth. Eradication activities were concentrated on contiguous areas of infestation detected by surveys in 1955 in the tri-state area of New York, New Jersey, and Pennsylvania. A total of 587,500 acres were sprayed in this area. Other cooperative eradication spraying included an additional 10,000 acres in Pennsylvania and 100,000 acres in Michigan. The isolated infestation in Lansing, Michigan, and vicinity, has been virtually eradicated as a result of extensive survey and spraying operations conducted since its discovery in 1954. These combined efforts constituted the initial steps in an accelerated program aimed at progressive eradication of the gypsy moth.

Suppression activities by state agencies against present epidemic outbreaks included the spraying of more than 89,000 acres in New York and 155,000 acres in the New England States. The continuation of large-scale suppression spraying within the area of general infestation, together with heavy mortality of larvae and pupae due to wilt disease and parasites reduced gypsy moth infestations throughout much of New England to very low population levels. However, heavy infestations still persist in some sections, especially in northwestern Connecticut and in the eastern sector of the upper Hudson River Valley.

An extensive trapping survey was conducted in 1956 outside the regulated area for the purpose of delimiting infestation. This survey, followed by scouting, disclosed a few spots of very light infestation in this peripheral area. No infestations were indicated or found near the outer limits of the area trapped. All infestations found by trapping or by scouting within the southwestern peripheral area are scheduled for spraying this spring, along with a considera-

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<sup>1</sup>Information supplied by the Plant Pest Control Branch, Agricultural Research Service, U.S. Department of Agriculture, Moorestown, N. J.

ble area of general infestation in southeastern New York, including Long Island. The proposed spray program for 1957 will include approximately 18,000 acres in Michigan; 180,000 acres in New Jersey; 230,000 acres in Pennsylvania; and 140,000 acres in New York. Within the Federally-regulated area, an additional  $2\frac{1}{4}$  million acres will be sprayed in southern New York. Added to this will be thousands of acres sprayed for suppression purposes within the generally infested area to prevent defoliation, damage, and possible spread.

#### Saddled Prominent

This general hardwood feeder caused noticeable defoliation over more than 25,000 acres in Penobscot and Piscataquis Counties, Maine. This is a considerable increase over the area reported in 1955. The extensive infestation in western Massachusetts decreased sharply in intensity and extent in 1956. The persistent infestation in eastern Rensselaer County, New York, was serious enough again this year to warrant the airplane spraying of approximately 2,150 acres with DDT (12-percent oil solution) by the New York Conservation Department. A localized outbreak caused heavy defoliation of sugar maple, birch, and beech over an area of about 500 acres in southern New Hampshire. Widely scattered outbreaks by this insect are expected again in 1957.

#### Fall Cankerworm

This geometrid and its close kin, the spring cankerworm, are long-established enemies of our northern deciduous forests. Spraying operations are conducted annually in many towns throughout the region to protect shade trees and forest trees in special-use areas. In northern New Jersey, where spraying has been conducted regularly, defoliation in 1956 was lighter than in the past several years and control operations were somewhat curtailed. Scattered infestations in the coastal areas of Maine covered approximately 1,500 acres. Over 600 acres on Sugarloaf Mountain in Maryland were stripped by the fall cankerworm. Light defoliation by this insect occurred at a number of localities in central Pennsylvania and West Virginia.

## Variable Oak Leaf Caterpillar

The pest responsible for the defoliation of large areas of mixed oaks in southern New Jersey, Delaware, and Maryland in 1956 was identified as this sporadically abundant pest, Heterocampa manteo. Heavy infestations extended southward into Virginia. Much of the area affected re-foliated by the end of the season, but continued attack of the severity observed this year could cause considerable damage. Several other oak defoliators were also abundant and closely associated with the variable oak leaf caterpillar. These included the brown anisota (Anisota virginiensis), the red-humped oakworm (Symmerista albicosta), and the yellow-necked caterpillar (Datana ministra). Conditions may be favorable again in 1957 for a combined attack by this troupe.

## MAJOR FOREST DISEASES

### Wood Rots

A major amount of growth-loss in forest trees is caused by wood-rotting fungi. Thinning in plantations may result in wounding of roots or trunks, thus exposing the trees to infection by the fungi. Root- and butt-rot caused by Fomes annosus is becoming increasingly important in older plantations of red and white pines, particularly in pure stands. It has been reported, or has been suspected, to be the cause of increasing mortality. Limited field observations were made in Massachusetts, Connecticut, and New York in 1956. Thinning operations in red and white pine stands seem to favor the spread of the fungus. It infects roots and stumps of the cut trees and spreads to roots of surrounding living trees. It is probably present in many recently-thinned plantations, but it is difficult to detect. The gradual dying of trees surrounding a rotting stump may be an indication of the presence of the fungus. Occasionally in unthinned stands, infection may start in wounds on roots of living trees. Studies of the relation of site factors to infection and methods of preventing or retarding infection in thinned plantations have been started.

Heart-rots, particularly those caused by Fomes pini and Polyporus borealis, were found in old-growth red spruce at high elevations in the Green Mountain National Forest. The amount of rot seemed to have no direct relation to the excessive mortality of the overmature spruce. One case of rot caused by Poria asiatica was identified from culture.

This is probably the first report of the isolation of the fungus in rot studies in the Northeast.

Root- and butt-rot by Polyporus tomentosus in uneven-aged stands of spruce caused some loss in merchantable timber in Maine.

### Cankers

In general, cankers result in more damage to plantation trees than to forest trees. No serious outbreaks were reported during the past season. Canker caused by Nectria galligena was reported on yellow and black birch in the Allegheny National Forest. Bleeding canker, especially on sugar maple in New Hampshire and Massachusetts, was severe in some areas. Occasionally root- and butt-rot by Armillaria mellea seemed to follow infection by the canker fungus Phytophthora cactorum. On Norway spruce in New York and Vermont, cankers caused by Cytospora kunzei continue to cause trouble. Tympanis canker has been reported as generally distributed in red pine plantations in New York.

### Dieback And Wilts

Oak wilt (Ceratocystis fagacearum) was reported from additional localities in Maryland, between Savage Mountain in Garrett County and Fairview Mountain just west of Hagerstown. In south-central Pennsylvania, approximately 300 areas of wilted oaks were located by aerial survey. Oak wilt continues to be serious in West Virginia. No evidence of the disease was found by aerial crews along the New York side of the Pennsylvania-New York border. Scouting in New Jersey during 1954 and through 1956 was done by ground observation. On May 25, 1956, a late freeze resulted in severe damage to oaks in the south-central part of the state. Leaves became discolored and many had fallen by July. Refoliation occurred during August, but an insect defoliator at that time also caused considerable loss of leaves. By September, trees defoliated by frost or insects were again green in foliage. However, the defoliation prevented reliable scouting for oak wilt. One tree located in Stelton was suspected, but cultures from specimens were negative. Thus oak wilt is not known to exist in New Jersey. New England also is apparently still free from the disease.

White pine blister rust (Cronartium ribicola) and its control continues to be of primary importance in the Adirondack and Catskill regions of New York, and in Vermont. Aecial production on pines in New York was reported as particularly heavy in 1956. Infection on Ribes was somewhat delayed because of the late season.

Needle rusts on conifers are rarely of importance in the growth of forest trees. However, on young plantation trees, rusts may become epidemic and very damaging. Coleosporium solidaginis was reported on red pine seedlings in Stockbridge, Massachusetts, and on loblolly pine in the Petersburg State Reservation in Delaware.

Ash leaf rust (Puccinia peridermiospora) varies in intensity from year to year. Along the Atlantic coast from Maine to Connecticut, infection seems to be always present. Yearly observations in New Hampshire revealed heavy infection in 1953 and 1954, very light in 1955, but increased severity in 1956. In Massachusetts it was reported from the Boston area southward, and in the Cape Cod area. No practical control is yet known.

### Seedling and Nursery Diseases

Damping-off is generally a control problem in forest tree seedbeds, and methods of control are being investigated in Maine and Vermont. Root rot of yellow-poplar nursery stock, caused by Cylindrocladium scoparium, was reported from West Virginia. The relation of this fungus to damping-off and root rot of coniferous seedlings and its control is being studied in Maine. The disease has been previously reported in coniferous nursery stock in Connecticut, New Jersey, Delaware, and Pennsylvania.

Needle-cast diseases, such as those caused by Lophodermium pinastri on pines and Rhabdocline pseudotsugae on Douglas-fir, are of importance in nurseries and Christmas tree plantations. The fall of needles in their second season causes a weakening and slight retarding of growth. Increased severity of infection was reported from Connecticut and New York.

## Diseases Of Unknown Origin

Oak dieback has been widely reported, but in general it does not seem to be increasing in intensity. In an aerial survey in New York, very few additional affected red oaks were found. In Pennsylvania, the trouble has been reported on red, scarlet, and black oaks in the vicinity of Bloomsburg, Williamsport, and Renovo. In some areas it was difficult to find an unaffected red oak. Other associated tree species in the area were not affected. The decline in vigor of affected trees is slow, starting as foliage browning and dieback at the top, and gradually progressing downward. Cankers are sometimes present on the trunks or branches. It usually is several years before the tree dies. Occasionally the roots may be attacked by Armillaria mellea while the trees are still alive. Drought has been reported as a possible factor, since rainfall has been deficient in Pennsylvania during the past 4 years.

In Pocahontas County, West Virginia, aerial surveys and ground checks showed that nearly all scarlet oaks had symptoms of the trouble. On ten 1-acre plots, a check of diseased trees indicated an average loss of 50 scarlet oaks per acre. Trees that were observed to have symptoms in 1953 and 1954 were dead in 1956, with loosened falling bark. Occasional red and black oaks were affected. In Hardy County, some white and chestnut oak, as well as scarlet oak, had similar symptoms. Canker-like lesions on red oaks and black oaks in the Coopers Rock State Forest near Morgantown, West Virginia, have been reported as a probable result of the severe drought in 1953. In 1955, many of these bark lesions had become healed over with callus. No fungus pathogen was obtained in isolations from the lesions. Cankers were common on all sides of the trees, although more abundant on the south side. Red oaks on ridge tops, and those with twin stems, were most susceptible. No conspicuous dieback or mortality of cankered trees had occurred.

Sweetgum blight in the Coastal Plain of Maryland is still causing considerable dieback and mortality. It is also reported as heavy in northern Delaware.

Birch dieback continues to be present in New Hampshire, Maine, and New York. However, its distribution was reported to be more limited than in previous years. Late frosts in scattered areas were considered responsible for some of the dieback that occurred early in 1956.

A dieback of small twigs scattered through the crowns of large beech trees in Maine was reported in the spring of

1956. The leaves turn brown in late summer and the twig dies back to the fork. The twig adjoining at the fork remains healthy. No pathogen has been isolated from these twigs. On some of the affected trees, cankers with roughened, loosened bark were present, but there seemed to be no relation between the dieback and the cankers.

White pine needle blight, which caused considerable concern in 1954 and 1955, was not so prevalent in 1956. Slight injury occurred in small localized areas in Maine and Massachusetts. White pines in the Monongahela National Forest, West Virginia, showed varying amounts of reddish-brown discoloration of the needles on about 300 trees in five areas. The trouble was noticeable first on the sides exposed to the light. The exact factors of soil or environment responsible for the rather rapid outbreak of the discoloration were not evident.

Table 1.--The forest insect situation in the Northeast, 1956

## MAJOR FOREST INSECTS

| Insect                   | Host                                        | Locality affected                                                                        | Extent                                                                                                                  | Degree of infestation                                         | Recommended control action                                                                                                   |
|--------------------------|---------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Spruce budworm           | Balsam fir; white, red, & black spruces     | Maine, northern New Hampshire (Coos Co.)                                                 | General distribution                                                                                                    | Light-heavy<br>Very light                                     | None.<br>None.                                                                                                               |
| Pine sawflies            | All pines                                   | Regionwide                                                                               | Local infestations<br>1-2,000 acres                                                                                     | Light-heavy,<br>most severe in N.Y., N.J., Md.                | Spray with DDT where feasible.                                                                                               |
| White pine weevil        | White pine, Norway spruce, & other conifers | Regionwide                                                                               | General distribution                                                                                                    | Light-heavy                                                   | Knapsack spraying of lead arsenate, DDT, or lindane with extender in small areas; helicopter spraying of DDT where feasible. |
| Pine leaf aphid          | White pine & red spruce (alternate hosts)   | Maine, northern New Hampshire, Vermont, New York (Adirondacks), Pennsylvania (Adams Co.) | General distribution                                                                                                    | Light-heavy, most severe in Me. and Vt.                       | Spray with contact insecticide where feasible.                                                                               |
| Balsam woolly aphid      | Balsam fir                                  | Eastern and central Maine                                                                | General distribution                                                                                                    | Light-heavy, continuing tree mortality in all areas affected. | Sanitation-salvage cuttings where feasible; shortened rotation.                                                              |
| European pine shoot moth | Red, Scotch, & mugho pines                  | Regionwide, except northern New England and New York                                     | General distribution                                                                                                    | Light-heavy, most serious in N.Y. and Pa.                     | None as yet.                                                                                                                 |
| Nantucket pine tip moth  | Loblolly, Virginia, & other pines           | Massachusetts (Cape Cod), southern Connecticut, New Jersey, Delaware, Maryland           | General distribution                                                                                                    | Light-heavy, most serious in Del. and Md.                     | None as yet.                                                                                                                 |
| Red pine scale           | Red pine                                    | Connecticut (southeastern)<br><br>New York (southeastern, including Long Island)         | Scattered throughout area of 150 sq.mi. near Bridgeport, spreading slowly north & eastward<br><br>Scattered small areas | Light-heavy<br><br>Light-heavy                                | Destroy infested trees.<br><br>Destroy infested trees.                                                                       |

(continued.)

Table 1.--(continued.)

| Insect                                  | Host                                                                    | Locality affected                                                    | Extent                                                       | Degree of infestation                                     | Recommended control action                                                                                             |
|-----------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Pine engraver beetles<br>( <u>Ips</u> ) | Pines & other conifers                                                  | Regionwide                                                           | General distribution                                         | Light-heavy, most serious in N.H., Mass., Conn., and N.Y. | Avoid injury to residual trees in thinning and logging operations. Remove infested and high risk trees where feasible. |
| Pales weevil                            | Young conifers                                                          | Regionwide                                                           | Localized in areas planted or naturally seeded after cutting | Light-heavy                                               | Do not replant for 2 to 3 years after cutting. Spray seedlings with lead arsenate or lindane with extender.            |
| European spruce sawfly                  | White, red, & black spruce                                              | Maine (central & southeastern)                                       | General distribution                                         | Light-heavy                                               | None.                                                                                                                  |
| White pine cone beetle                  | White pine                                                              | Regionwide                                                           | General distribution                                         | Light-heavy                                               | None.                                                                                                                  |
| Bagworm                                 | Red cedar, arborvitae, willow, black locust, other conifers & hardwoods | New Jersey, Maryland, Delaware, West Virginia, Pennsylvania          | General distribution                                         | Light-heavy                                               | Spray with lead arsenate where feasible.                                                                               |
| Gypsy moth                              | Hardwoods, white pine, & hemlock                                        | New England, eastern New York, northern Pennsylvania, and New Jersey | General distribution                                         | Light-heavy                                               | Airplane spraying with DDT-mist-blower applications where feasible.                                                    |
| Fall cankerworm                         | Hardwoods                                                               | Maine (southeastern)                                                 | 1,500 acres                                                  | Heavy                                                     | Aerial or mist-blower application of DDT.                                                                              |
|                                         |                                                                         | Pennsylvania (central)                                               | General distribution                                         | Light                                                     | None.                                                                                                                  |
|                                         |                                                                         | New Jersey (northern)                                                | General distribution                                         | Light-medium                                              | Spray with DDT where feasible.                                                                                         |
|                                         |                                                                         | Maryland (Sugarloaf Mt.)                                             | 600 acres                                                    | Heavy                                                     | None.                                                                                                                  |
|                                         |                                                                         | West Virginia                                                        | General distribution                                         | Light                                                     | None.                                                                                                                  |
| Saddled prominent                       | Hardwoods                                                               | Maine (Penobscot & Piscataquis Co.)                                  | 25,000 acres                                                 | Light-heavy                                               | None.                                                                                                                  |
|                                         |                                                                         | New York (Rensselaer Co.)                                            | 2,300 acres                                                  | Medium-heavy                                              | Airplane spraying with DDT.                                                                                            |
|                                         |                                                                         | New Hampshire (Merrimac Co.)                                         | 500 acres                                                    | Heavy                                                     | None, in 1956.                                                                                                         |

(continued.)

Table 1.--(continued.)

| Insect                        | Host                                 | Locality affected                               | Extent                | Degree of infestation                          | Recommended control action                                    |
|-------------------------------|--------------------------------------|-------------------------------------------------|-----------------------|------------------------------------------------|---------------------------------------------------------------|
| Orange-striped oak worm       | Oaks                                 | New York (Lake George)                          | 50 acres              | Heavy                                          | Airplane spraying with DDT.                                   |
|                               |                                      | Rhode Island (southern)                         | Scattered small areas | Light-heavy, apparent increase                 | Spray with DDT where feasible.                                |
|                               |                                      | Pennsylvania (Franklin Co.)                     | Scattered small areas | Light-medium                                   | None.                                                         |
| Variable oak leaf caterpillar | Oaks                                 | Southern New Jersey, Delaware, eastern Maryland | General distribution  | Heavy                                          | None.                                                         |
| Maple leaf cutter             | Sugar maple                          | Vermont                                         | General distribution  | Medium-heavy                                   | Airplane spraying with DDT.                                   |
| Beech scale                   | Beech                                | Maine, Vermont, New Hampshire, eastern New York | General distribution  | Light-heavy, increasing in Vermont             | Sanitation-salvage cutting where feasible.                    |
| Forest tent caterpillar       | Aspen, sugar maple & other hardwoods | Northern New England, & New York                | Scattered             | Light to negligible                            | None.                                                         |
| Bronze birch borer            | Birches                              | Maine                                           | General distribution  | Light-medium, trees re-covering in most areas. | Proper forest management practices.                           |
| MINOR FOREST INSECTS          |                                      |                                                 |                       |                                                |                                                               |
| Balsam twig aphid             | Balsam fir                           | Maine, New Hampshire, Vermont                   | General distribution  | Light-heavy                                    | None.                                                         |
| Pine tortoise scale           | Virginia & jack pines                | West Virginia (eastern), Pennsylvania           | Localized             | Heavy                                          | None.                                                         |
| Pine twig & bark aphids       | Various pines                        | Regionwide                                      | General distribution  | Light-heavy                                    | Spray Christmas trees and ornaments with contact insecticide. |
| Pine spittlebug               | Pitch, white, & Scotch pines         | Rhode Island, New York                          | General distribution  | Light-heavy                                    | None.                                                         |
| Leaf miner                    | Pitch pine                           | Rhode Island                                    | General distribution  | Heavy                                          | None.                                                         |
| Spruce gall aphids            | Spruces                              | Regionwide                                      | General distribution  | Light-heavy                                    | Spray Christmas trees and ornaments with contact insecticide. |

(continued.)

Table 1.--(continued.)

| Insect                    | Host                           | Locality affected                     | Extent                   | Degree of infestation                         | Recommended control action                                        |
|---------------------------|--------------------------------|---------------------------------------|--------------------------|-----------------------------------------------|-------------------------------------------------------------------|
| Black-headed budworm      | Balsam fir & spruces           | Maine (central & northern)            | General distribution     | Light, some increase                          | None.                                                             |
| Pine gall weevil          | Red pine                       | Maine (western)                       | In scattered plantations | Light-heavy                                   | None.                                                             |
|                           | Virginia pine                  | Delaware                              | General distribution     | Light                                         | None.                                                             |
| Mites                     | Conifers, & some hardwoods     | Regionwide                            | General distribution     | Light-heavy                                   | Spray with miticide where feasible.                               |
| Eastern larch beetle      | Eastern larch                  | Maine (central & southern)            | Scattered small areas    | Light-medium                                  | None.                                                             |
| Larch sawfly              | European larch                 | Pennsylvania (Clinton Co.)            | 10 acres                 | Heavy                                         | None.                                                             |
| Satin moth                | Poplars, including cottonwoods | Maine, Vermont, New York              | Scattered small areas    | Light-heavy                                   | Spray with DDT where feasible.                                    |
| Oak twig pruner           | Oaks                           | Regionwide                            | General distribution     | Light-heavy                                   | Collect and burn fallen twigs where feasible.                     |
| Locust leaf miner         | Black locust                   | Regionwide                            | General distribution     | Light-heavy, most severe in Md. and W. Va.    | Spray with DDT where feasible.                                    |
| Yellow-necked caterpillar | Oaks                           | Delaware                              | General distribution     | Heavy                                         | None.                                                             |
| Walnut caterpillar        | Black walnut                   | Delaware & south-central Pennsylvania | General distribution     | Heavy                                         | Spray with DDT where feasible.                                    |
| Birch leaf miner          | Gray birch                     | Southern New England, New Jersey      | General distribution     | Light-medium, apparent decrease in most areas | Spray with nicotine sulfate, lindane, or dieldrin where feasible. |
| Pit-making oak scale      | White & chestnut oaks          | Pennsylvania                          | General distribution     | Light                                         | Sanitation-salvage cutting where feasible.                        |
|                           |                                | New York (Letchworth State Park)      | 50 acres                 | Medium                                        | None.                                                             |

(continued.)

Table 1.--(continued.)

| Insect                   | Host                  | Locality affected                               | Extent                      | Degree of infestation | Recommended control action                      |
|--------------------------|-----------------------|-------------------------------------------------|-----------------------------|-----------------------|-------------------------------------------------|
| Elm spanworm             | Red maple             | Vermont (Addison Co.)                           | Scattered spot infestations | Light-heavy           | None.                                           |
| Beech leaf tier          | Beech                 | Maine (eastern)                                 | General distribution        | Light-medium          | None.                                           |
|                          |                       | Delaware (northern)                             | General distribution        | Heavy                 | None.                                           |
| Red-humped oak worm      | Oaks                  | Delaware                                        | General distribution        | Light                 | None.                                           |
| Sugar maple borer        | Sugar maple           | Maine, Pennsylvania                             | General distribution        | Light-medium          | None.                                           |
| Poplar tentmaker         | Poplars & willows     | Delaware, Maryland                              | Localized                   | Light-heavy           | None.                                           |
| Asiatic oak weevil       | Oaks                  | Delaware, West Virginia                         | General distribution        | Light-heavy           | None.                                           |
| Lacebugs                 | Oaks, sycamore        | West Virginia, Maryland, Delaware               | General distribution        | Light-heavy           | None.                                           |
| Pin oak sawfly           | Pin oak               | New Jersey (Mercer Co.)                         | Localized                   | Light                 | None.                                           |
| Eastern tent caterpillar | Cherries              | Rhode Island, West Virginia, Maryland, Delaware | General distribution        | Heavy                 | Spray with DDT where feasible.                  |
| Brown anisota            | Oaks                  | Delaware (Kent & Sussex Co.)                    | General distribution        | Light                 | None.                                           |
| Fall webworm             | Hardwoods             | Rhode Island, Maryland                          | General distribution        | Light                 | None.                                           |
| Elm leaf beetle          | Elms                  | Maine, Rhode Island, Maryland                   | General distribution        | Light                 | Spray with DDT or lead arsenate where feasible. |
| Mimosa webworm           | Mimosa & honey locust | Maryland                                        | General distribution        | Light-medium          | Spray with DDT or lindane.                      |
| Hickory tussock moth     | Black walnut          | Delaware (New Castle Co.)                       | Localized                   | Medium                | None.                                           |

Table 2.--The forest disease situation in the Northeast, 1956

| Disease                                    | Host            | Locality affected                                                                                              | Extent                                                 | Degree of infection or injury                             | Recommended control action                          |
|--------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------|
| Blister rust                               | White pine      | Vermont                                                                                                        | General distribution                                   | Light-heavy                                               | Ribes eradication.                                  |
|                                            |                 | New York                                                                                                       | General distribution (2,301,621 acres of control area) | Light-heavy                                               | Ribes eradication.                                  |
|                                            |                 | Maryland (Garrett Co.)                                                                                         | Scattered                                              | Light-moderate                                            | Ribes eradication.                                  |
| Butt rot<br><u>Polyporus tomentosus</u>    | Spruces         | Maine (Waldo Co.)                                                                                              | Localized                                              | Heavy, in pure spruce stands                              | None.                                               |
| Cytospora canker                           | Norway spruce   | Vermont (Plymouth, Williamstown)                                                                               | Localized                                              | Light-heavy in plantations. Some tree mortality reported. | Sanitation cuts and thinning.                       |
|                                            |                 | New York                                                                                                       | General distribution                                   | Light                                                     | Thinning at proper intervals. Proper site location. |
| Hemlock mortality                          | Eastern hemlock | Pennsylvania (Clarion Co.)                                                                                     | Localized                                              | Light                                                     | None.                                               |
| Needle cast<br><u>Rhabdocline</u>          | Douglas-fir     | New York                                                                                                       | Localized                                              | Light-moderate in plantations                             | None.                                               |
| Needle blight                              | White pine      | Maine (southern)<br>Massachusetts,<br>New Hampshire,<br>New Jersey                                             | Scattered                                              | Light                                                     | None.                                               |
|                                            |                 | West Virginia (Greenbrier Co.)                                                                                 | General distribution                                   | Heavy                                                     | None.                                               |
| Red heart<br><u>Stereum sanguinolentum</u> | Norway spruce   | New York (Reforestation area Oneida 20)                                                                        | 100 acres                                              | Light-medium                                              | None.                                               |
| Red rot<br><u>Fomes annosus</u>            | Red pine        | Massachusetts, New York, Connecticut                                                                           | Localized                                              | Light-medium                                              | None, as yet.                                       |
| Tympanis canker                            | Red pine        | New York                                                                                                       | General distribution                                   | Light-heavy                                               | Early pruning.                                      |
| Beech scale-<br><u>Nectria</u>             | Beech           | New Hampshire, Vermont, New York, (Catskill region & Columbia Co.); West Virginia (Fernow Experimental Forest) | Localized                                              | Light-heavy                                               | See control of Beech scale.                         |

(continued.)

Table 2.--(continued.)

| Disease                     | Host                           | Locality affected                                                                              | Extent                                                | Degree of infection or injury | Recommended control action                                                  |
|-----------------------------|--------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------|
| Birch dieback               | Yellow & white birch           | New Hampshire (northeastern), New York (Adirondacks)                                           | General distribution in New York over 2,000,000 acres | Light-heavy                   | None.                                                                       |
| Bleeding canker and dieback | Sugar maple, other hardwoods   | Maine, New Hampshire, Vermont, Massachusetts                                                   | General distribution                                  | Medium-heavy                  | Pruning; salvage cuttings                                                   |
| Leaf rust                   | White, green, red, & black ash | Coastal areas of Maine, New Hampshire, Massachusetts                                           | General distribution                                  | Light-heavy                   | None.                                                                       |
| Nectria canker              | Yellow & black birch           | Pennsylvania (Allegheny Natl. Forest)                                                          | General distribution                                  | Moderate, in pole-size trees  | Stand improvement cutting.                                                  |
| Oak wilt                    | Oaks                           | Pennsylvania (south-central)                                                                   | Localized                                             | Medium                        | Treatment of wilted trees and poisoning of trees in 50-foot control circle. |
|                             |                                | Maryland (in mountains west of Hagerstown)                                                     | General distribution                                  | Light                         |                                                                             |
|                             |                                | West Virginia (east & southeast)                                                               | General distribution                                  | Heavy                         |                                                                             |
| Oak dieback                 | Red & scarlet oaks             | New York (Cattaraugus Co.)                                                                     | 500 acres                                             | Light                         | None.                                                                       |
|                             |                                | Pennsylvania (Allegheny River Valley); New York (State Line to Warren, Pa. Also south-central) | General distribution                                  | Light-slight decrease in 1956 |                                                                             |
|                             |                                | West Virginia (Pocahontas, Greenbrier, Pendleton, Mineral Co.)                                 | Scattered along ridges                                | Light                         |                                                                             |
| Pit canker                  | Elm                            | New Hampshire (southern)                                                                       | Scattered                                             | Light-medium                  | None.                                                                       |
| Shoestring rot              | Maples, other hardwoods        | New Hampshire                                                                                  | General distribution                                  | Light-moderate                | None.                                                                       |
| Sweetgum blight             | Sweetgum                       | Maryland (Coastal Plain), Delaware (northern), West Virginia                                   | General distribution                                  | Light-heavy                   | None.                                                                       |

(continued.)

Table 2.--(continued.)

| Disease           | Host                          | Locality affected                         | Extent               | Degree of infection or injury | Recommended control action |
|-------------------|-------------------------------|-------------------------------------------|----------------------|-------------------------------|----------------------------|
| Verticillium wilt | Maples, elms                  | New Hampshire                             | Scattered            | Light-decrease in 1956        | Sanitation cutting.        |
| Willow blight     | Willows                       | New Hampshire, Maine (central & southern) | Localized            | Light-decrease in 1956        | Sanitation cutting.        |
| Frost injury      | Beech, oak, maples, & hickory | Regionwide                                | General distribution | Light-heavy                   |                            |
| Winter injury     | Conifers                      | Regionwide                                | General distribution | Light-heavy                   |                            |